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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/092,231	03/06/2002	Shiro Sakai	08228.021001	8663

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EXAMINER	
NGUYEN, JOSEPH H	
ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 12/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/092,231	SAKAI, SHIRO	
	Examiner	Art Unit	
	Joseph Nguyen	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 November 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 5-6, 7-10, 12-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Koide.

Regarding claim 1, Koide discloses on figure 2 a method for manufacturing a gallium nitride compound semiconductor comprising the steps of forming a first gallium nitride compound semiconductor 21 on a substrate 1; forming of a composition material 22 of the first gallium nitride compound semiconductor a discrete area on the first gallium nitride compound semiconductor; and forming a second gallium nitride compound semiconductor 3 on the first gallium nitride compound semiconductor on which the composition material is formed; wherein a spatial fluctuation is created in the band gap by a variation in the compositional ratio in the second gallium nitride compound semiconductor created by the composition material, and the second gallium nitride compound semiconductor is a light emitting layer (right hand side of column 3).

Regarding claim 2, Koide discloses on figure 2 the first gallium nitride compound semiconductor 21 and the second gallium nitride compound 3 are AlGaN; and the composition material is Ga.

Regarding claim 3, Koide discloses on figure 2 a method of manufautring a gallium nitride compound semiconductor comprising the steps of forming a base layer 21 on a substrate 1, the base layer constructed by forming a discrete layer for varying the diffusion lengths of composition materials of a gallium nitride compound semiconductor; and forming the gallium nitride compound semiconductor on the base layer; wherein a spatial fluctuation is created in the band gap by creating a variation in the compositional ratio in the gallium nitride compound semiconductor by varying the diffusion lengths of the composition materials and the gallium nitride compound semiconductor is a ligth emitting layer (right hand side of column 3).

Regarding claim 5, Koide discloses on figure 1 a method for manufacturing a gallium nitride compound semiconductor comprising the steps of forming on a substrate 1 a base layer 21 having a lattice mismatch; and forming the gallium nitride compound semiconductor 22 on the base layer; wherein a spatial fluctuation is created in the band gap of the gallium nitride compound semiconductor by the lattice mismatch, and the gallium nitride compound semiconductor is a light emitting layer (right hand side of column 3).

Regarding claim 6, Koide discloses on figure 1 the lattice mismatch is formed by discretely forming at least one of AlN, INN, AlGaN.

Regarding claim 7, Koide discloses on figure 1 the gallium nitride compound semiconductor has a super-lattice structure of AlGaN (right hand side of column 3).

Regarding claim 8, Koide discloses on figure 1 a light emitting element comprising a gallium nitride compound semiconductor, the light emitting element comprising a substrate 1; a first gallium nitride compound semiconductor layer 21 on the substrate; a composition material 22 of the first gallium nitride compound semiconductor formed as a discrete area on the first gallium nitride compound semiconductor layer; and a second gallium nitride compound semiconductor layer 22 having a varied compositional ratio and formed on the first gallium nitride compound semiconductor layer onto which the composition material is formed, and the second gallium nitride compound semiconductor is a light emitting layer.

Regarding claim 9, Koide discloses on figure 1 the first gallium nitride compound semiconductor and the second gallium nitride compound semiconductor are AlGaN; and the composition is Ga.

Regarding claim 10, Koide discloses on figure 1 a light emitting element comprising a gallium nitride compound semiconductor, the light emitting element comprising a substrate 1; a base layer formed on the substrate and constructed by forming a discrete layer for varying the diffusion lengths of the composition materials of the gallium nitride compound semiconductor; and gallium nitride compound semiconductor layer having a varied compositional ratio and formed on the base layer and the gallium nitride compound semiconductor is a light emitting layer (right hand side of column 3).

Regarding claim 12, Koide discloses on figure 1 a light emitting element using a gallium nitride compound semiconductor, the light emitting element comprising a substrate 1; a base layer 21 formed on the substrate and having lattice mismatch; and a gallium nitride compound semiconductor 22 formed on the base layer and having a spatial fluctuation in the band gap, and the gallium nitride compound semiconductor is a light emitting layer (right hand side of column 3).

Regarding claim 13, Koide discloses on figure 1 the gallium nitride compound semiconductor layer has a super-lattice structure 9right hand side of column 3).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koide as applied to claims 3 and 10 above, and further in view of Sakai.

Regarding claims 4 and 11, Koide discloses substantially all steps of the method or structures set forth in the claimed invention except the layer for varying the diffusion lengths of the composition materials formed from SiN. However, Sakai et al discloses on figure 3 the layer for varying the diffusion lengths of the composition materials formed from SiN. In view of such teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Koide by having the

layer for varying the diffusion lengths of the composition materials formed from SiN for the purpose of reducing dislocation density in a light-emitting element.

Response to Arguments

Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (703) 308-1269. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7382 for regular communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JN
December 8, 2003

GEORGE ECKERT
PRIMARY EXAMINER